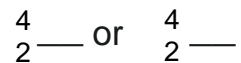


CONCEPT: ALPHA DECAY

- **Alpha Decay** occurs when an _____ nucleus emits an *alpha particle*.

□ **Alpha particle:** consists of ____ protons and ____ neutrons; usually symbolized as:

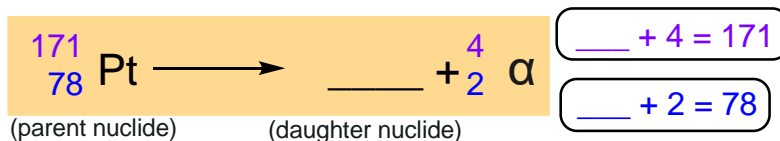


□ Typically occurs in _____ nuclei with excess protons and neutrons.

- Produces a stable Helium atom (He-4).

- When balancing nuclear reactions of any type of radioactivity, must always balance:

□ **Atomic number** (____) and _____ **number** on both sides.



EXAMPLE: Write a balanced nuclear reaction for alpha decay of $^{204}_{88}\text{Ra}$.

Characteristics of Alpha Particles

- **Ionizing power** is the ability of an energetic particle to _____ atoms and molecules.
- **Penetrating power** is the ability of an energetic particle to pass through _____.

Types of Radioactivity

Type	Particle	Example	Size	Ionizing Power	Penetrating Power	Shield
Alpha Decay	_____	$^{171}_{78}\text{Pt} \longrightarrow ^{167}_{76}\text{Os} + \begin{array}{c} 4 \\ 2 \end{array} \alpha$	_____	_____	_____	_____ _____

□ Because of high ionizing power, alpha particles are considered the _____ damaging to biological tissues.

EXAMPLE: Select the correct statement about alpha decay.

- Parent nuclide gains 2 protons and 2 neutrons.
- Produces radiation by absorbing a helium nucleus.
- Alpha particles easily penetrate cells.
- When alpha decay occurs in an unstable atom, the mass # decreases by 4 and atomic # decreases by 2.